

# Auxiliary contact blocks - with spring terminals

## Accessories



CA3-10S

### Description


The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits. CA3 1-pole auxiliary contact blocks, designed for standard industrial environments, are equipped with:

- N.O. or N.C. contacts.
- spring-type connecting terminals.

All 1-pole auxiliary contact blocks are protected against accidental direct contact and bear the corresponding function marking.

A maximum of two 1-pole auxiliary contact blocks can be front-mounted on 1-stack contactors or 1-stack contactor relays.

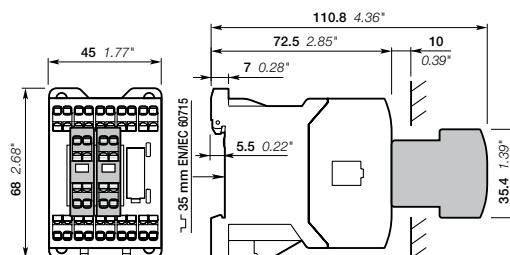
### Ordering details

For contactors	For contactor relays	Contact blocks	Type	Order code	Pkg qty	Weight (1 pce)
						kg

#### 1-pole auxiliary contact blocks with spring terminals

AS09..S ... AS16..S	NS..S, NSL..S	1 -	CA3-10S	1SBN011019T1010	10	0.011
ASL09..S ... ASL16..S		- 1	CA3-01S	1SBN011019T1001	10	0.011

### Main dimensions mm, inches



# Auxiliary contact blocks - with spring terminals

## Front mounting

### Technical data

Types	1-pole CA3..S
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### Contact utilization characteristics according to IEC

Standards	IEC 60947-5-1 and EN 60947-5-1	
Rated insulation voltage $U_i$ acc. to IEC 60947-5-1	690 V	
Rated impulse withstand voltage $U_{imp}$	6 kV	
Rated operational voltage $U_e$ max.	690 V	
Conventional thermal current $I_{th}$ - $\theta \leq 40^\circ\text{C}$	10 A	
$I_e$ / Rated operational current AC-15 acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A
	220-240 V 50/60 Hz	4 A
	400-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Making capacity	10 x $I_e$ AC-15 acc. to IEC 60947-5-1	
Breaking capacity	10 x $I_e$ AC-15 acc. to IEC 60947-5-1	
$I_e$ / Rated operational current DC-13 acc. to IEC 60947-5-1	24 V DC	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.27 A / 60 W
	250 V DC	0.27 A / 68 W
	Short-circuit protection device gG type fuse	10 A
Rated short-time withstand current $I_{sc}$ $\theta = 40^\circ\text{C}$	for 1.0 s	100 A
	for 0.1 s	140 A
Minimum switching capacity with failure rate acc. to IEC 60947-5-4	12 V / 3 mA	
Power dissipation per pole at 6 A	0.1 W	
Mechanical durability	Number of operating cycles	10 millions operating cycles
	Max. switching frequency	3600 cycles/h
	Max. electrical switching frequency	AC-15
AC-13		900 cycles/h
Mechanically linked contact acc. to annex L of IEC 60947-5-1	Additional N.O. or N.C. auxiliary contacts (CA3..S aux. contact blocks) are mechanically linked contacts	
Mirror contacts acc. to annex F of IEC 60947-4-1	Additional N.C. auxiliary contacts (CA3..S aux. contact blocks) are mirror contacts	

### Contact utilization characteristics according to UL / CSA

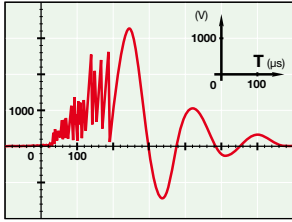
Standards	UL 508, CSA C22.2 N°14
Max. operational voltage	690 V AC, 250 V DC
Pilot duty	A600, Q300
AC thermal rated current	10 A
AC maximum volt-ampere making	7200 VA
AC maximum volt-ampere breaking	720 VA
DC thermal rated current	2.5 A
DC maximum volt-ampere making-breaking	69 VA

### Connecting characteristics

Connection capacity (min. ... max.)		
	Rigid solid	1 x 0.75...2.5 mm <sup>2</sup>
		2 x 0.75...2.5 mm <sup>2</sup>
	Flexible with non insulated ferrule	1 x 0.75...2.5 mm <sup>2</sup>
		2 x 0.75...2.5 mm <sup>2</sup>
	Flexible with insulated ferrule	1 x 0.75...1.5 mm <sup>2</sup>
		2 x 0.75...1.5 mm <sup>2</sup>
Connection capacity acc. to UL / CSA		1 or 2 x AWG 18...14
Stripping length		10 mm
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529	IP20	
Screw terminals	Spring terminals	
All terminals	Spring terminals	
Screwdriver type	Flat Ø 3.5	

# Surge suppressors for contactor coils

## Accessories



### Description

The operation of inductive circuits causes overvoltages, in particular on opening the contactor coil. The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to the breakdown of insulators and even the destruction of certain sensitive components. The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay. Following a burst of discharges with a very steep slope, a damped oscillation emerges with a peak value of 3500 V.

### Overvoltage Factor

The overvoltage factor  $k$  is defined as the ratio of the maximum overvoltage peak value  $\hat{U}_s$  to the peak value  $\hat{U}_c$  of the coil rated control voltage  $U_c$ :

$$k = \frac{\hat{U}_s \text{ max.}}{\hat{U}_c} \quad \text{in DC} \quad k = \frac{\hat{U}_s \text{ max.}}{U_c} \quad \text{in AC} \quad k = \frac{\hat{U}_s \text{ max.}}{U_c \sqrt{2}}$$

For example the following is obtained for the above graph:  $k = \frac{3500}{42 \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the  $k$  factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.

Each case is different, but the technical data tolerances and generous sizing of parts have enabled us to reduce the number of variants.

We have chosen the following solutions: transil diodes, varistors and RC blocks.

Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.



RV5



RC5-1

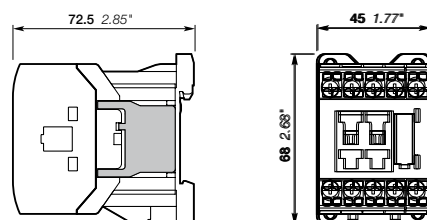


RT5

### Ordering details

For contactors	For contactor relays	Rated control circuit voltage - $U_c$			Type	Order code	Pkg qty	Weight (1 pce) kg
		V	DC	AC				
AS..S, ASL..S	NS..S, NSL..S	24...50	●	●	RV5/50	1SBN050010R1000	2	0.015
		50...133	●	●	RV5/133	1SBN050010R1001	2	0.015
		110...250	●	●	RV5/250	1SBN050010R1002	2	0.015
		250...440	●	●	RV5/440	1SBN050010R1003	2	0.015
AS..S	NS..S	24...50	-	●	RC5-1/50	1SBN050100R1000	2	0.012
		50...133	-	●	RC5-1/133	1SBN050100R1001	2	0.012
		110...250	-	●	RC5-1/250	1SBN050100R1002	2	0.012
		250...440	-	●	RC5-1/440	1SBN050100R1003	2	0.012
ASL..S	NSL..S	12...32	●	-	RT5/32	1SBN050020R1000	2	0.015
		25...65	●	-	RT5/65	1SBN050020R1001	2	0.015
		50...90	●	-	RT5/90	1SBN050020R1002	2	0.015
		77...150	●	-	RT5/150	1SBN050020R1003	2	0.015
		150...264	●	-	RT5/264	1SBN050020R1004	2	0.015

### Main dimensions mm, inches



**Easy connection to the coil terminals**  
(parallel mounting)  
Clip-on for both fixing and connection.

**No additional space**  
Clipped onto the right side part of the contactor base without changing contactor overall dimensions and keeping a free access to coil terminals.

# Surge suppressors for contactor coils

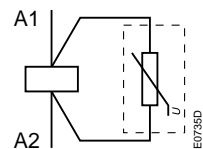
## Technical data

<b>Varistor</b>	<b>RV5/50</b>	<b>RV5/133</b>	<b>RV5/250</b>	<b>RV5/440</b>
Rated control circuit voltage $U_c$	24...50 V AC	50...133 V AC	110...250 V AC	250...440 V AC
Residual overvoltage (clipping voltage)	24...50 V DC	50...133 V DC	110...250 V DC	250...440 V DC
	132 V AC	270 V AC	480 V AC	825 V AC
	132 V DC	270 V DC	480 V DC	825 V DC
Opening time growth factor	none			
Operating temperature	-20...+70 °C			
Advantages	High energy absorption: good damping - Unpolarized system.			
Drawback	Clipping as from $U_{vdr}^*$ , thus voltage front up to this point.			
	* $U_{vdr}$ = Varistor operating voltage (voltage dependent resistor), tolerance $\pm 10\%$ .			

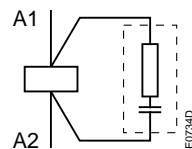
<b>RC type</b>	<b>RC5-1/50</b>	<b>RC5-1/133</b>	<b>RC5-1/250</b>	<b>RC5-1/440</b>
Rated control circuit voltage $U_c$	24...50 V AC	50...133 V AC	110...250 V AC	250...440 V AC
Residual overvoltage (clipping voltage)	2 to 3 x $U_c$ max.			
Opening time growth factor	2...3			
Operating temperature	-20...+70 °C			
Advantages	Very fast clipping - Attenuation of steep fronts and thus of high frequencies.			

<b>Transil diode</b>	<b>RT5/32</b>	<b>RT5/65</b>	<b>RT5/90</b>	<b>RT5/150</b>	<b>RT5/264</b>
Rated control circuit voltage $U_c$	12...32 V DC	25...65 V DC	50...90 V DC	77...150 V DC	150...264 V DC
Residual overvoltage (clipping voltage)	50 V DC	100 V DC	150 V DC	210 V DC	390 V DC
Opening time growth factor	1.1...1.2				
Operating temperature	-20...+70 °C				
Advantages	Good energy absorption - Unpolarized system - Simple, reliable system.				
Drawback	Delay on drop out which does not however reduce contactor breaking capacity.				

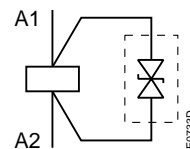
### Wiring diagrams



**Varistor**



**RC type**



**Transil diode**

# Voltage code table

The below tables indicate the available coil voltages and corresponding digits for order codes. When placing an order, please give either type or order code. Select a standard contactor from ordering detail pages. Change the **coil voltage code** in the type or in the order code according to the table below. Example: for contactor AS09-30-10S and coil 42 V 50/60 Hz, type is AS09-30-10S-**21** and order code is 1SBL101004R**21**10.

## 3-pole contactors - with spring terminals

**Type** AS16 - 30 - 10S - 26

Auxiliary contacts: N.O., N.C.  
Main contacts: N.O., N.C.

**Order code** 1SBL121004R 26 10

**Contactor type**  
AS .. S AC operated  
ASL .. S DC operated

AC coil code		DC coil code
50 Hz	60 Hz	
20	24 V	24 V
21	42 V	42 V
22	48 V	48 V
23	110 V	110 V
24	115 V	115 V
16	-	120 V
25	220 V	220 V
26	230 V	230 V
27	240 V	240 V
17	-	277 V
13	380 V	-
28	400 V	400 V
29	415 V	415 V

DC coil code	Voltage
80	12 V
81	24 V
83	48 V
84	60 V
86	110 V
87	125 V
88	220 V
89	240 V

## Contactor relays - with spring terminals

**Type** NS 40 ES - 26

Number contacts: N.O., N.C.

**Order code** 1SBH101004R 26 40

**Contactor type**  
NS .. S AC operated  
NSL .. S DC operated

AC coil code		DC coil code
50 Hz	60 Hz	
20	24 V	24 V
21	42 V	42 V
22	48 V	48 V
23	110 V	110 V
24	115 V	115 V
16	-	120 V
25	220 V	220 V
26	230 V	230 V
27	240 V	240 V
17	-	277 V
13	380 V	-
28	400 V	400 V
29	415 V	415 V

DC coil code	Voltage
80	12 V
81	24 V
83	48 V
84	60 V
86	110 V
87	125 V
88	220 V
89	240 V

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## Order code classification

Order code	Type	Page	Order code	Type	Page	Order code	Type	Page
1SBH101004R1622	NS22ES-16	20	1SBL101004R2832	AS09-30-32S-28	6	1SBN050100R1002	RC5-1/250	34
1SBH101004R1631	NS31ES-16	20	1SBL103004R8101	ASL09-30-01S-81	5	1SBN050100R1003	RC5-1/440	34
1SBH101004R1640	NS40ES-16	20	1SBL103004R8110	ASL09-30-10S-81	5	1SBN081020R1000	BEA16-3U	9
1SBH101004R1644	NS44ES-16	20	1SBL103004R8132	ASL09-30-32S-81	7			
1SBH101004R1653	NS53ES-16	20	1SBL103004R8301	ASL09-30-01S-83	5			
1SBH101004R1662	NS62ES-16	20	1SBL103004R8310	ASL09-30-10S-83	5			
1SBH101004R1671	NS71ES-16	20	1SBL103004R8332	ASL09-30-32S-83	7			
1SBH101004R1680	NS80ES-16	20	1SBL103004R8601	ASL09-30-01S-86	5			
1SBH101004R2022	NS22ES-20	20	1SBL103004R8610	ASL09-30-10S-86	5			
1SBH101004R2031	NS31ES-20	20	1SBL103004R8632	ASL09-30-32S-86	7			
1SBH101004R2040	NS40ES-20	20	1SBL103004R8801	ASL09-30-01S-88	5			
1SBH101004R2044	NS44ES-20	20	1SBL103004R8810	ASL09-30-10S-88	5			
1SBH101004R2053	NS53ES-20	20	1SBL103004R8832	ASL09-30-32S-88	7			
1SBH101004R2062	NS62ES-20	20	1SBL111004R1601	AS12-30-01S-16	4			
1SBH101004R2071	NS71ES-20	20	1SBL111004R1610	AS12-30-10S-16	4			
1SBH101004R2080	NS80ES-20	20	1SBL111004R1632	AS12-30-32S-16	6			
1SBH101004R2622	NS22ES-26	20	1SBL111004R2001	AS12-30-01S-20	4			
1SBH101004R2631	NS31ES-26	20	1SBL111004R2010	AS12-30-10S-20	4			
1SBH101004R2640	NS40ES-26	20	1SBL111004R2032	AS12-30-32S-20	6			
1SBH101004R2644	NS44ES-26	20	1SBL111004R2601	AS12-30-01S-26	4			
1SBH101004R2653	NS53ES-26	20	1SBL111004R2610	AS12-30-10S-26	4			
1SBH101004R2662	NS62ES-26	20	1SBL111004R2632	AS12-30-32S-26	6			
1SBH101004R2671	NS71ES-26	20	1SBL111004R2801	AS12-30-01S-28	4			
1SBH101004R2680	NS80ES-26	20	1SBL111004R2810	AS12-30-10S-28	4			
1SBH101004R2822	NS22ES-28	20	1SBL111004R2832	AS12-30-32S-28	6			
1SBH101004R2831	NS31ES-28	20	1SBL113004R8101	ASL12-30-01S-81	5			
1SBH101004R2840	NS40ES-28	20	1SBL113004R8110	ASL12-30-10S-81	5			
1SBH101004R2844	NS44ES-28	20	1SBL113004R8132	ASL12-30-32S-81	7			
1SBH101004R2853	NS53ES-28	20	1SBL113004R8301	ASL12-30-01S-83	5			
1SBH101004R2862	NS62ES-28	20	1SBL113004R8310	ASL12-30-10S-83	5			
1SBH101004R2871	NS71ES-28	20	1SBL113004R8332	ASL12-30-32S-83	7			
1SBH101004R2880	NS80ES-28	20	1SBL113004R8601	ASL12-30-01S-86	5			
1SBH103004R8122	NSL22ES-81	21	1SBL113004R8610	ASL12-30-10S-86	5			
1SBH103004R8131	NSL31ES-81	21	1SBL113004R8632	ASL12-30-32S-86	7			
1SBH103004R8140	NSL40ES-81	21	1SBL113004R8801	ASL12-30-01S-88	5			
1SBH103004R8144	NSL44ES-81	21	1SBL113004R8810	ASL12-30-10S-88	5			
1SBH103004R8153	NSL53ES-81	21	1SBL113004R8832	ASL12-30-32S-88	7			
1SBH103004R8162	NSL62ES-81	21	1SBL121004R1601	AS16-30-01S-16	4			
1SBH103004R8171	NSL71ES-81	21	1SBL121004R1610	AS16-30-10S-16	4			
1SBH103004R8180	NSL80ES-81	21	1SBL121004R1632	AS16-30-32S-16	6			
1SBH103004R8322	NSL22ES-83	21	1SBL121004R2001	AS16-30-01S-20	4			
1SBH103004R8331	NSL31ES-83	21	1SBL121004R2010	AS16-30-10S-20	4			
1SBH103004R8340	NSL40ES-83	21	1SBL121004R2032	AS16-30-32S-20	6			
1SBH103004R8344	NSL44ES-83	21	1SBL121004R2601	AS16-30-01S-26	4			
1SBH103004R8353	NSL53ES-83	21	1SBL121004R2610	AS16-30-10S-26	4			
1SBH103004R8362	NSL62ES-83	21	1SBL121004R2632	AS16-30-32S-26	6			
1SBH103004R8371	NSL71ES-83	21	1SBL121004R2801	AS16-30-01S-28	4			
1SBH103004R8380	NSL80ES-83	21	1SBL121004R2810	AS16-30-10S-28	4			
1SBH103004R8622	NSL22ES-86	21	1SBL121004R2832	AS16-30-32S-28	6			
1SBH103004R8631	NSL31ES-86	21	1SBL123004R8101	ASL16-30-01S-81	5			
1SBH103004R8640	NSL40ES-86	21	1SBL123004R8110	ASL16-30-10S-81	5			
1SBH103004R8644	NSL44ES-86	21	1SBL123004R8132	ASL16-30-32S-81	7			
1SBH103004R8653	NSL53ES-86	21	1SBL123004R8301	ASL16-30-01S-83	5			
1SBH103004R8662	NSL62ES-86	21	1SBL123004R8310	ASL16-30-10S-83	5			
1SBH103004R8671	NSL71ES-86	21	1SBL123004R8332	ASL16-30-32S-83	7			
1SBH103004R8680	NSL80ES-86	21	1SBL123004R8601	ASL16-30-01S-86	5			
1SBH103004R8822	NSL22ES-88	21	1SBL123004R8610	ASL16-30-10S-86	5			
1SBH103004R8831	NSL31ES-88	21	1SBL123004R8632	ASL16-30-32S-86	7			
1SBH103004R8840	NSL40ES-88	21	1SBL123004R8801	ASL16-30-01S-88	5			
1SBH103004R8844	NSL44ES-88	21	1SBL123004R8810	ASL16-30-10S-88	5			
1SBH103004R8853	NSL53ES-88	21	1SBL123004R8832	ASL16-30-32S-88	7			
1SBH103004R8862	NSL62ES-88	21	1SBN011019T1001	CA3-01S	32			
1SBH103004R8871	NSL71ES-88	21	1SBN011019T1010	CA3-10S	32			
1SBH103004R8880	NSL80ES-88	21	1SBN031005T1000	VM3	9			
1SBL101004R1601	AS09-30-01S-16	4	1SBN050010R1000	RV5/50	34			
1SBL101004R1610	AS09-30-10S-16	4	1SBN050010R1001	RV5/133	34			
1SBL101004R1632	AS09-30-32S-16	6	1SBN050010R1002	RV5/250	34			
1SBL101004R2001	AS09-30-01S-20	4	1SBN050010R1003	RV5/440	34			
1SBL101004R2010	AS09-30-10S-20	4	1SBN050020R1000	RT5/32	34			
1SBL101004R2032	AS09-30-32S-20	6	1SBN050020R1001	RT5/65	34			
1SBL101004R2601	AS09-30-01S-26	4	1SBN050020R1002	RT5/90	34			
1SBL101004R2610	AS09-30-10S-26	4	1SBN050020R1003	RT5/150	34			
1SBL101004R2632	AS09-30-32S-26	6	1SBN050020R1004	RT5/264	34			
1SBL101004R2801	AS09-30-01S-28	4	1SBN050100R1000	RC5-1/50	34			
1SBL101004R2810	AS09-30-10S-28	4	1SBN050100R1001	RC5-1/133	34			

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## Type classification

Type	Order code	Page	Type	Order code	Page	Type	Order code	Page
AS09-30-01S-16	1SBL101004R1601	4	NS22ES-16	1SBH101004R1622	20	RV5/250	1SBN050010R1002	34
AS09-30-01S-20	1SBL101004R2001	4	NS22ES-20	1SBH101004R2022	20	RV5/440	1SBN050010R1003	34
AS09-30-01S-26	1SBL101004R2601	4	NS22ES-26	1SBH101004R2622	20	VM3	1SBN031005T1000	9
AS09-30-01S-28	1SBL101004R2801	4	NS22ES-28	1SBH101004R2822	20			
AS09-30-10S-16	1SBL101004R1610	4	NS31ES-16	1SBH101004R1631	20			
AS09-30-10S-20	1SBL101004R2010	4	NS31ES-20	1SBH101004R2031	20			
AS09-30-10S-26	1SBL101004R2610	4	NS31ES-26	1SBH101004R2631	20			
AS09-30-10S-28	1SBL101004R2810	4	NS31ES-28	1SBH101004R2831	20			
AS09-30-32S-16	1SBL101004R1632	6	NS40ES-16	1SBH101004R1640	20			
AS09-30-32S-20	1SBL101004R2032	6	NS40ES-20	1SBH101004R2040	20			
AS09-30-32S-26	1SBL101004R2632	6	NS40ES-26	1SBH101004R2640	20			
AS09-30-32S-28	1SBL101004R2832	6	NS40ES-28	1SBH101004R2840	20			
AS12-30-01S-16	1SBL111004R1601	4	NS44ES-16	1SBH101004R1644	20			
AS12-30-01S-20	1SBL111004R2001	4	NS44ES-20	1SBH101004R2044	20			
AS12-30-01S-26	1SBL111004R2601	4	NS44ES-26	1SBH101004R2644	20			
AS12-30-01S-28	1SBL111004R2801	4	NS44ES-28	1SBH101004R2844	20			
AS12-30-10S-16	1SBL111004R1610	4	NS53ES-16	1SBH101004R1653	20			
AS12-30-10S-20	1SBL111004R2010	4	NS53ES-20	1SBH101004R2053	20			
AS12-30-10S-26	1SBL111004R2610	4	NS53ES-26	1SBH101004R2653	20			
AS12-30-10S-28	1SBL111004R2810	4	NS53ES-28	1SBH101004R2853	20			
AS12-30-32S-16	1SBL111004R1632	6	NS62ES-16	1SBH101004R1662	20			
AS12-30-32S-20	1SBL111004R2032	6	NS62ES-20	1SBH101004R2062	20			
AS12-30-32S-26	1SBL111004R2632	6	NS62ES-26	1SBH101004R2662	20			
AS12-30-32S-28	1SBL111004R2832	6	NS62ES-28	1SBH101004R2862	20			
AS16-30-01S-16	1SBL121004R1601	4	NS71ES-16	1SBH101004R1671	20			
AS16-30-01S-20	1SBL121004R2001	4	NS71ES-20	1SBH101004R2071	20			
AS16-30-01S-26	1SBL121004R2601	4	NS71ES-26	1SBH101004R2671	20			
AS16-30-01S-28	1SBL121004R2801	4	NS71ES-28	1SBH101004R2871	20			
AS16-30-10S-16	1SBL121004R1610	4	NS80ES-16	1SBH101004R1680	20			
AS16-30-10S-20	1SBL121004R2010	4	NS80ES-20	1SBH101004R2080	20			
AS16-30-10S-26	1SBL121004R2610	4	NS80ES-26	1SBH101004R2680	20			
AS16-30-10S-28	1SBL121004R2810	4	NS80ES-28	1SBH101004R2880	20			
AS16-30-32S-16	1SBL121004R1632	6	NSL22ES-81	1SBH103004R8122	21			
AS16-30-32S-20	1SBL121004R2032	6	NSL22ES-83	1SBH103004R8322	21			
AS16-30-32S-26	1SBL121004R2632	6	NSL22ES-86	1SBH103004R8622	21			
AS16-30-32S-28	1SBL121004R2832	6	NSL22ES-88	1SBH103004R8822	21			
ASL09-30-01S-81	1SBL103004R8101	5	NSL31ES-81	1SBH103004R8131	21			
ASL09-30-01S-83	1SBL103004R8301	5	NSL31ES-83	1SBH103004R8331	21			
ASL09-30-01S-86	1SBL103004R8601	5	NSL31ES-86	1SBH103004R8631	21			
ASL09-30-01S-88	1SBL103004R8801	5	NSL31ES-88	1SBH103004R8831	21			
ASL09-30-10S-81	1SBL103004R8110	5	NSL40ES-81	1SBH103004R8140	21			
ASL09-30-10S-83	1SBL103004R8310	5	NSL40ES-83	1SBH103004R8340	21			
ASL09-30-10S-86	1SBL103004R8610	5	NSL40ES-86	1SBH103004R8640	21			
ASL09-30-10S-88	1SBL103004R8810	5	NSL40ES-88	1SBH103004R8840	21			
ASL09-30-32S-81	1SBL103004R8132	7	NSL44ES-81	1SBH103004R8144	21			
ASL09-30-32S-83	1SBL103004R8332	7	NSL44ES-83	1SBH103004R8344	21			
ASL09-30-32S-86	1SBL103004R8632	7	NSL44ES-86	1SBH103004R8644	21			
ASL09-30-32S-88	1SBL103004R8832	7	NSL44ES-88	1SBH103004R8844	21			
ASL12-30-01S-81	1SBL113004R8101	5	NSL53ES-81	1SBH103004R8153	21			
ASL12-30-01S-83	1SBL113004R8301	5	NSL53ES-83	1SBH103004R8353	21			
ASL12-30-01S-86	1SBL113004R8601	5	NSL53ES-86	1SBH103004R8653	21			
ASL12-30-01S-88	1SBL113004R8801	5	NSL53ES-88	1SBH103004R8853	21			
ASL12-30-10S-81	1SBL113004R8110	5	NSL62ES-81	1SBH103004R8162	21			
ASL12-30-10S-83	1SBL113004R8310	5	NSL62ES-83	1SBH103004R8362	21			
ASL12-30-10S-86	1SBL113004R8610	5	NSL62ES-86	1SBH103004R8662	21			
ASL12-30-10S-88	1SBL113004R8810	5	NSL62ES-88	1SBH103004R8862	21			
ASL12-30-32S-81	1SBL113004R8132	7	NSL71ES-81	1SBH103004R8171	21			
ASL12-30-32S-83	1SBL113004R8332	7	NSL71ES-83	1SBH103004R8371	21			
ASL12-30-32S-86	1SBL113004R8632	7	NSL71ES-86	1SBH103004R8671	21			
ASL12-30-32S-88	1SBL113004R8832	7	NSL71ES-88	1SBH103004R8871	21			
ASL16-30-01S-81	1SBL123004R8101	5	NSL80ES-81	1SBH103004R8180	21			
ASL16-30-01S-83	1SBL123004R8301	5	NSL80ES-83	1SBH103004R8380	21			
ASL16-30-01S-86	1SBL123004R8601	5	NSL80ES-86	1SBH103004R8680	21			
ASL16-30-01S-88	1SBL123004R8801	5	NSL80ES-88	1SBH103004R8880	21			
ASL16-30-10S-81	1SBL123004R8110	5	RC5-1/50	1SBN050100R1000	34			
ASL16-30-10S-83	1SBL123004R8310	5	RC5-1/133	1SBN050100R1001	34			
ASL16-30-10S-86	1SBL123004R8610	5	RC5-1/250	1SBN050100R1002	34			
ASL16-30-10S-88	1SBL123004R8810	5	RC5-1/440	1SBN050100R1003	34			
ASL16-30-32S-81	1SBL123004R8132	7	RT5/32	1SBN050020R1000	34			
ASL16-30-32S-83	1SBL123004R8332	7	RT5/65	1SBN050020R1001	34			
ASL16-30-32S-86	1SBL123004R8632	7	RT5/90	1SBN050020R1002	34			
ASL16-30-32S-88	1SBL123004R8832	7	RT5/150	1SBN050020R1003	34			
BEA16-3U	1SBN081020R1000	9	RT5/264	1SBN050020R1004	34			
CA3-01S	1SBN011019T1001	32	RV5/50	1SBN050010R1000	34			
CA3-10S	1SBN011019T1010	32	RV5/133	1SBN050010R1001	34			